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INTRODUCTION

Pea aphids (*Acyrtosiphom pisum*) can damage plants both directly from feeding and indirectly through transmission of viruses. In faba bean (*Vicia faba*) the economic losses due to aphid infestations can be significant. This project will test the efficiency of three insecticides, Matador (Lambda-cyhalothrin), Voliam Xpress (Lambda-cyhalothrin + chlorantraniliprole) and Exirel (Cyantraniliprole) in controlling pea aphids on faba bean. We hypothesized that all three insecticides have similar efficacy in pea aphid control.

RESEARCH OBJECTIVES

- To evaluate the efficacy of three insecticides (Lambda-cyhalothrin 100g/L, Cyantraniliprole 120g/L, and Lambda-cyhalothrin 50g/L with Cyantraniliprole 100g/L) against pea aphids on faba bean.

METHODS

Experimental Design: Experiments were conducted in two fields (Saskatoon Farm & Llewelyn Farm) at the AAFC Saskatoon Research and Extension Center. Fields were planted with a common non-tannin faba bean variety (CDC Snowdrop). A randomized split-plot design was used with aphid density as the main plot effect and insecticide treatment (Table 1) as the split plot effect. Each treatment was replicated five times at each site.

Table 1. Characteristics of insecticides tested

| Brand Name (trade name) | Active Ingredients (common name) | IRAC Group | Application rate in 200L water |
|-------------------------|---------------------------------------|------------|--------------------------------|
| Exirel ¹ | Cyantraniliprole | 28 | 1400 ml/ha |
| Matador ² | Lambda-cyhalothrin | 3A | 150 ml/ha |
| Voliam Xpress | Lambda-cyhalothrin & Cyantraniliprole | 3 & 28 | 500 ml/ha |

Insecticide Application: Matador and Voliam Xpress were applied using a CO₂ backpack sprayer at an intermediate suggested published rate. Exirel was applied at a rate suggested by the manufacturer. Control plots were sprayed with water. Water sensitive spray cards were used to ensure consistency of application.

Data Collection: Total number of aphids was counted on a per four plant per density basis prior to insecticide application. Following application, three plants were counted per insecticide treatment. Aphids were counted using a cutting and shaking method.



Fig. 2. A,B: aphids feeding on stem and young leaf tissue (before spraying); **C:** The CO₂ sprayer.

RESULTS

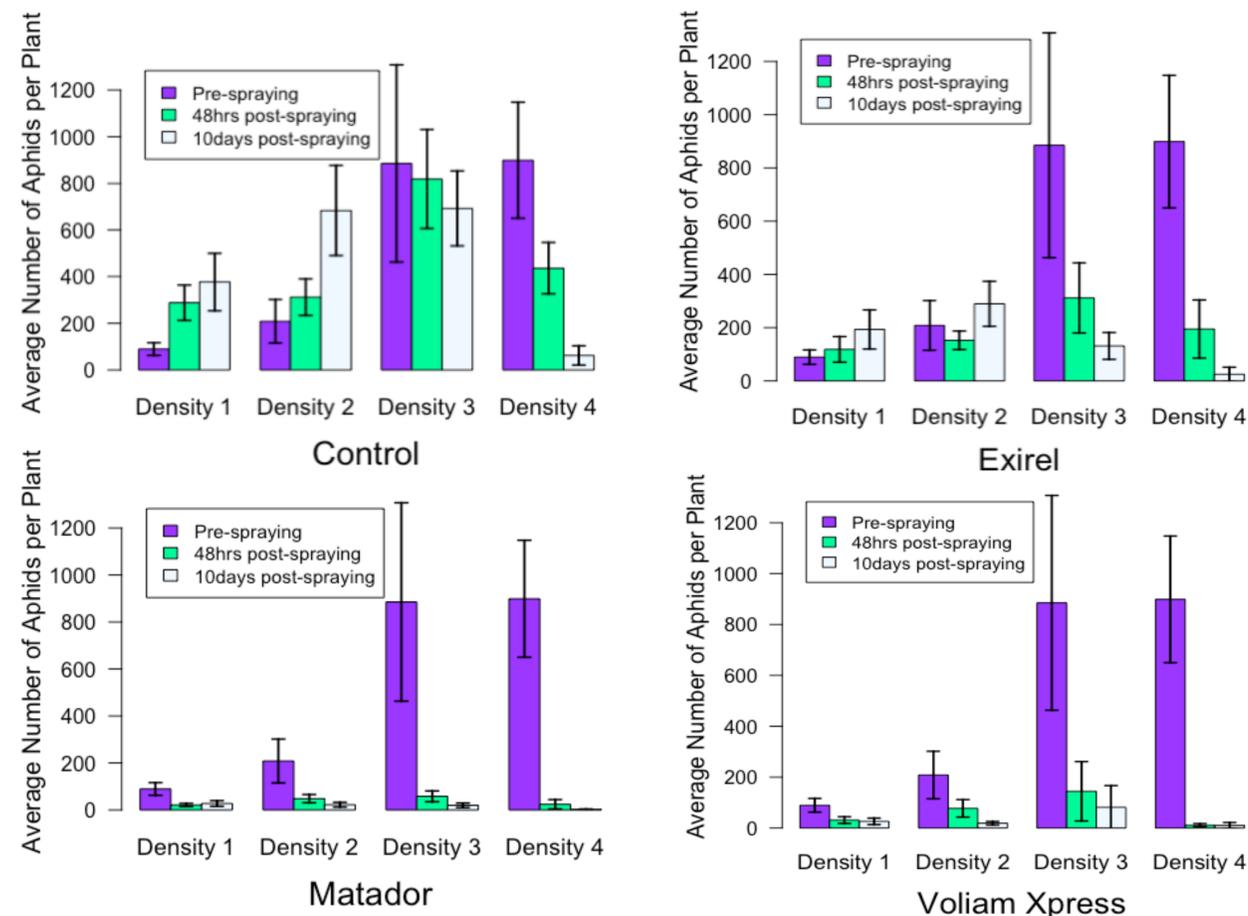


Fig. 2. Average number of aphids per faba plant before spray, 48hrs and 10 days after spray – water (control), Exirel, Matador and Voliam Xpress.

Table 2. Anova Table from General Linear Model Analysis

| Factor | Chi square (X ²) | Df | P-value |
|----------------------|------------------------------|----|----------|
| Treatments | 17.57 | 3 | < 0.0001 |
| Density | 29.61 | 3 | < 0.0001 |
| Spraying | 34.92 | 2 | < 0.0001 |
| Treatments: Density | 4.09 | 9 | 0.91 |
| Treatments: Spraying | 27.30 | 6 | < 0.0001 |



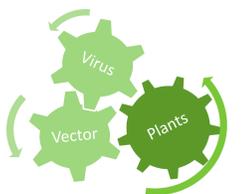
Fig. 3. Untreated Control (left) vs. Treatments (right) in Sasaktoon farm site.

CONCLUSIONS

- Matador, Exirel and Voliam Xpress can control pea aphid effectively on faba bean.
- Aphid density does not effect the efficiency of three insecticides tested.
- Matador and Voliam Xpress may have better control in pea aphids than Exirel.
- In an effort to limit development of insecticide resistance, producers should rotate between Voliam Xpress and Matador when controlling pea aphid.
- It may be worth considering registration of Exirel for faba beans.
- Given the high densities unmanaged pea aphids can reach in untreated fields, it will be important to evaluate yield and to develop appropriate economic thresholds for pea aphid in faba bean.

FUTURE WORK

- Determine the economic threshold for optimal control of pea aphid management.
- Determine of PSbMV (Pea Seed Borne Mosaic Virus) symptoms on faba bean.
- Determine the relationship between number of pea aphids and PSbMV transmission efficiency on normal tannin and non-tannin faba bean.



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REFERENCES

- [1] Saskatchewan Ministry of Agriculture. 2019. 2019 guide to crop protection: for the chemical management of weeds, plant diseases and insects. Government of Saskatchewan.